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MEMORANDUM FOR: Information Handling Systems Architect

FROM: Bruce T. Johnson  
Director, Office of Data ProcessingSUBJECT: Background Information for the IHSA  
Strategic Plan

Bob:

In a recent informal note you raised several questions and indicated a need for certain information for use in the draft Strategic Plan for Information Handling. I am responding "on the record" so as to facilitate your use of the data, which I hope will prove responsive to your concerns.

1. Distributed Data Bases

The selection of the Wang family of word processing devices will also provide a capability to support local creation and manipulation of data. ODP plans to develop the necessary interfaces that would enable a user of a Wang device to transmit information to and from the VM system. Initially this capability will be limited to simple file transfers; later, specific Wang text control codes will be automatically translated such that the capabilities of destination devices (ETECS, high quality/speed printers, other WP devices) can be utilized. ODP also plans to integrate Wang mail with AIM so that documents can move between users of both systems. The capabilities of the Wang OIS and VS systems will be evaluated to determine the most efficient and flexible methodology whereby these new information handling tools can easily exploit existing central functions.

2. BUS/Twisted Pair

Current OC projections indicate an adequate twisted pair capability for the immediate future and ODP has no plans to abandon this approach for at least the next few years. Current SAFE and DDO plans also call for twisted pair, not BUS telecommunications. There is a concern that twisted pair technology will be inadequate to support the 10K terminal goal by 1989. During FY-83, a study will be initiated to address the future telecommunications architecture and transition timing. Of particular interest, in addition to terminal capacity, will be the requirement for Baud rates that cannot be supported by twisted pair and the relative costs of BUS supported terminals. In addition to BUS technology, a MERCURY based internal network using twisted pairs for transmission might be advantageous. NPIC's use and evaluation of the BUS will be closely monitored as

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will the emergence of any de facto industry standards.

### 3. Availability

Availability goals for all systems in the Ruffing and Special Computer Centers were 96% in 1981 and 97% this year. As in past years, not all of the supported systems will meet their goal, however, all systems are expected to exceed their 1981 performance. ODP has not established specific outyear goals for availability; rather we are committed to a continuous improvement as hardware/software, procedures and environment factors improve. Improvements in availability will be realized because of the collective benefits derived from:

#### a. Improving Hardware Stability

- The latest generation of CPU's (IBM 3081) is much more reliable than its predecessor 370-3033 technology.
- Likewise, the new 3380 DASD devices are a significant improvement over 3350/3330 devices. In addition to normal online capacity expansion, ODP plans, given budgetary support in FY-84, to replace all of the less reliable Telex 3350 devices.

#### b. Procedural Improvements

The analysis of human error has received and will continue to receive special attention. Added emphasis is being placed on the writing of consistent, well understood operational instructions, their rapid update to reflect change and the verification that appropriate personnel understand and are using pertinent procedures.

#### c. Self-Contained Backup

There will be an increasing emphasis to provide each of the major systems we support with sufficient hardware resources such that the service could continue (albeit at reduced capacity) in the event of a CPU or major peripheral failure. Our backup procedure to date, based on limited computational resources, was to move a failed service to a machine that normally supported a lower priority service. This switch, and the later return following system repair, has had an impact on availability. In the future, software switching to support backup will be greatly reduced.

#### d. Software Back-Out

More stringent requirements for documented and tested back-out procedures will be implemented. This applies to customer maintained applications as well as system software maintained by ODP. This will reduce the time lost which

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results from the introduction of faulty software.

e. Recovery Guidelines

ODP recently instituted guidelines which indicate the normally acceptable time frames that operational personnel can use to diagnose a problem, attempt corrective action, restart the system or go to an emergency back-up situation. These guidelines currently range from 15 to 45 minutes depending on specific systems, the nature of their software recovery features and the volatility of their associated data bases.

f. Environmental Improvements

While substantial relief is not expected until the new Headquarters compound building is ready in 1987-88, some interim activities such as the recently improved cooling capacity in the Ruffing Center and the plan to upgrade the raised floor in the Ruffing Center will have a beneficial impact. Ideally, additional contiguous space next to both the Ruffing and Special Centers should be provided not only to accomodate additional hardware but to provide a staging area and a safer separation of devices.

4. Development/Production

The basic guideline for the creation of a stand alone development capability is to do so when such development activity has a known and predictable impact on the ability of the users to access a production system. Such a step was taken a number of years ago when it became apparent that GIM developmental activities were having a detrimental impact on the productions applications. Later, independent GIM applications (CAMS and DDO) also retained the development--production separation.

Current SAFE plans call for a development CPU and associated peripherals that would be isolated from the CIA or DIA production systems.

The virtual machine environment of VM enables developmental and production activities to co-exist as long as total machine capacity is adequate. VM today supports a wide mix of program development and production support. AIM and RAMIS are but two examples of the latter. As the requirement for VM service continues to expand, we anticipate component oriented support by individual VM machines. Since all components are involved in both development and production work, an artificial development--production split is not contemplated.

Given adequate hardware and space resources we do plan to have a VM system available to back up the component oriented VM systems. It is very probable that this machine would be used for development activities by ODP and other large system developers

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when not being used in a back-up role.

#### 5. DBMS

The impetus for the acquisition of a common commercial DBMS lies with the implementation of a SAFE capability for the DDI or the DDO. If a commercial (non-GIM) solution is selected to satisfy their data base management requirements, then that package would also be made available to any other Agency user requiring sophisticated DBMS support. Regardless of this outcome, the selection of GIM to support CAMS2 will necessitate a long term support commitment to the GIM system.

If the SAFE development process does not select a new DBMS system, ODP will request FY-85 funds to conduct an indepth comparative analysis to determine the most cost effective DBMS approach to be pursued.

ODP is currently in the process of bringing up the ORACLE relational DBMS under VM for further evaluation. Support is also being extended to the evaluation of the VM-based INFO by the DDI and DDA/OL and the FOCUS system, in which the DDI has an interest.

#### 6. Management of Resource Utilization

The Project Accounting Reporting (PAR) system is used to track ADP resource usage for reporting to Agency managers. In particular, it has been used to support first EAG and later EXCOM review of the largest ADP projects (approximately 20-25) which together account for nearly 80% of the usage of central ADP resources. A new PAR system is being developed by Applications for the ODP Management Staff. The new system will provide improved accounting for the use of ADP resources.

#### 7. New Building

The Building Planning Staff has not yet allocated any office or machine grade space in the new building. Sufficient machine space is being planned to accomodate all existing Washington area machine space plus some expansion but we do not yet know what will be moved to the new building.

ODP is proceeding on the assumption that most of its current equipment will be relocated to the new building. We do plan to retain some subset of our capability in the existing building to provide a minimum level of capability should some form of disaster render either building inoperable. We have requested FY-84 resources to begin the planning necessary to support this move and the associated contingency activity.

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We have been tasked by several different offices to create or replace a number of large administrative systems, which we sometimes refer to as "corporate" systems. These include:

<u>Office</u>	<u>System</u>
OF	ACIS (Automated Compensation Information System)
	IFMS (Integrated Financial Management System)
OL	LIMS (Logistics Information Management System)
OP	PRIM (Personnel Resources Information Management)
OS	SIMS (Security Information Management System)
OIS	TRIS (Records Information Management System)

The developmental costs of these systems is circa \$50M. All are being worked currently and are in various stages of development. Our FY-84 program, already approved at the DDA level, contains initiatives to support ACIS and TRIS. The OL budget contains funds for LIMS (although not enough), and IFMS was not funded. All of the above are either new or replacement systems (hence, development work) and reflect the needs of our various customers. All systems will provide a more current design, will be more maintainable, and most will interact with other new and/or existing systems. All will provide more capability than is available today. Additional justification, including a sense of urgency associated with these systems can best be provided by the customer offices. We are asking all customers to prioritize all their requests for applications development to ensure appropriate allocation of scarce resources.

9. Standardized Terminal Environment

The Agency has utilized the Delta Data model 5260 and more recently model 7260 as its standard ADP terminal for a number of years. Recently, Wang was selected to satisfy the majority of WP requirements. ODP plans to continue support to the Delta Data such that its capabilities are fully utilized to provide the necessary interfaces to enable Wang users to communicate with the central systems and to evaluate the Wang equipment to ascertain its ability to satisfy ADP as well as WP functions.

10. Processing Center Architect

ODP sees no dramatic change in the future architecture of the processing centers. While the capabilities for distributed

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processing will continue to grow, especially with the arrival of the Wang cluster of WP devices, this is viewed as a logical extension of a trend that has been evident for some years. The utilization of central resources to complement such distributed facilities as ETECS, 4-Phase, cartographic devices and the population of NBI and other communicating WP devices has been well established.

The Ruffing Center and the Special Center have evolved to a point where compatible hardware and software is nearly universal. The recent decision to build SAFE around IBM compatible hardware and a base of existing software has insured that our third center will be completely compatible.

Only compartmentation restrictions precludes the flow of data between the Ruffing and Special Center. While data access requirements between the Northside (SAFE) Center (NCC) and the Ruffing Center have yet to be defined, no technical impediments are envisioned.

Such compatibility may lead to the establishment of a single output facility serving both the Northside Center and the Ruffing Center. This option will be exploited once NCC requirements are solidified.

#### 11. Plan for Terminals

The next step is the identification of a new standard family of analysts terminals will be the evaluation of the Wang family of devices to determine what role these devices can play in addressing Agency ADP as well as WP requirements. It would appear that the Wang terminal offers a TEMPEST, low cost solution to some ADP applications. Before we embark on the selection of still another standard, whether that be a high end, low end or whatever, we need to fully understand the capabilities and limitations of the existing devices.

Once the characteristics of the Wang devices are well understood, a determination can be made as to terminal capability shortfall, and the class of devices needed to address functional limitations.

If TEMPEST considerations can be satisfied, commercial off the shelf equipment would be the target in the selection of any new standard.

#### 12. Scientific and Technical Processing

ODP provides a massive batch processing capability for scientific and technical processing that historically has been sized to take care of the needs of DDS&T. It is IBM based, of course, as is the contractor world that S&T deals with. At various times in our history, the question of a need for a

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specialized "scientific" processor has been examined, and rejected on resource grounds. At the same time, the power inherent in subsequent upgrades of IBM processors has been more than adequate to meet not only the S&T need but the needs of all other users of scientific processing power.

In more recent times, a specialized class of super powerful machine (CRAY and CYBER) has been developed to meet a particular modeling requirement. The question of the suitability of such a machine is back on our agenda as a result of DDI interest. Independently, we in ODP have examined the need for such a machine on two previous occasions. A task force is to be constituted that includes ODP and IHSA representatives to examine the requirements for scientific processing.

How ODP will proceed depends very much on the outcome of the study performed by the task force. Clearly, there are several ways to go.

Technical staffs to support scientific and technical analyses for the Agency exist in several places where they are effective in meeting a decentralized needs. We support such analyses with the traditional kind of computer utility services we are chartered to provide. We lack the resources to provide for an institutionalized set of scientific programming resources. This activity has clearly migrated out of ODP and into the specific components where the needs of the individual user can be served.

I hope this information covers those aspects of Phase I goals which you felt needed elaboration. If we can help further, please call.

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